Research paper

Nonsuicidal self-injury (NSSI) amongst LGBT+ young adults: The role of psychological distress

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A B S T R A C T

Rates of nonsuicidal self-injury (NSSI) among lesbian, gay, bisexual, transgender, and other sexual or gender minority (LGBTQ+) young adults are high. Research is needed to elucidate potential mechanisms underpinning this elevated risk. In 2021, young adults in the United Kingdom and United States ($n = 1475$, aged 18–30) reported their NSSI history and psychological distress (Kessler Psychological Distress Scale) in an online survey. Participants were cisgender heterosexual (CH; $n = 1100$), cisgender sexual minority (CSM; lesbian, gay, bisexual, asexual) ($n = 272$), or gender minority (GM; transgender, non-binary) ($n = 103$). Rates of lifetime NSSI and psychological distress were significantly higher for GM participants than CSM participants (NSSI: OR = 2.68, $p < 0.001$ | Distress: Coef. = 5.22, $p < 0.001$), and significantly higher for CSM participants than CH participants (NSSI: OR = 3.39, $p < 0.001$, | Distress: Coef. = 3.08, $p < 0.001$). Cross-sectional mediational models (i.e., associational variable analysis) revealed that psychological distress partially accounted for the relationship between identity group and lifetime NSSI in a stepwise fashion, contributing to higher NSSI in the GM group compared to the CSM group, and higher NSSI in the CSM group compared to the CH group. Findings suggest GM young people are at elevated risk of NSSI and psychological distress relative to both CSM and CH peers, and disparities in distress levels may be a key driver of disparities in NSSI rates. While longitudinal mediation models are needed to verify this mechanism, findings support interventions aimed at reducing psychological distress and NSSI among LGBTQ+ young people.

Nonsuicidal self-injury (NSSI) refers to the direct, deliberate, self-inflicted, and culturally or socially unacceptable destruction of body tissue, which occurs in the absence of suicidal intent (International Society for the Study of Self-Injury, 2018). NSSI is highly heterogeneous, with common methods including cutting, burning, and self-battery (Klonsky, 2007; Somer et al., 2015). NSSI primarily functions as an emotional coping strategy (e.g., to regulate negative affect, communicate distress, or self-punish) (Edmondson et al., 2016; Taylor et al., 2018). NSSI can therefore be an indicator of serious distress and impairment, which is associated with a range of psychiatric diagnoses

(Muehlenkamp and Tillotson, 2024) and poor psychological well-being (Bjureberg et al., 2021). NSSI is associated with prolonged emotion regulation difficulties and high levels of stress and anxiety (Daukantaitė et al., 2021), future suicide attempts (Asarnow et al., 2011; Wilkinson et al., 2011), and completed suicide (Cooper et al., 2005). Moreover, there is significant stigma surrounding NSSI (Staniland et al., 2021) which may further compound individuals' distress and alienation (Lewis et al., 2025).

Given the adverse outcomes associated with NSSI, identifying high-risk populations is extremely important for targeted prevention and

intervention. Interest in the field is growing, yet there is still much to be learned (Hooley et al., 2020). Importantly, limited research has been conducted with lesbian, gay, bisexual, transgender, and other sexual minority or gender minority (LGBTQ+) populations, despite increasing evidence that they are at a particularly high risk of NSSI (Zullo et al., 2024). LGBTQ+ people consistently demonstrate worse mental health outcomes than their cisgender heterosexual (CH) counterparts, including higher levels of NSSI, depression, anxiety, and psychological distress (Choukas-Bradley et al., 2022). However, a notable limitation to much of the existing literature is the use of a broad LGBTQ+ category which combines cisgender sexual minority (CSM; lesbian, gay, bisexual, asexual) and gender minority (GM; transgender, non-binary, gender-fluid) individuals into one sample. Though studies directly comparing outcomes for CSM and GM individuals are relatively scarce, existing research suggests that GM individuals experience lower levels of psychological well-being than their CSM peers including higher levels of depression and suicide attempts (Price-Feeney et al., 2020; Su et al., 2016).

The literature provides a well-supported theoretical framework for understanding these mental health disparities among LGBTQ+ people. Meyer's Minority Stress Theory (2003) and the Gender Minority Stress and Resilience (GMSR) model (Testa et al., 2015) propose that LGBTQ+ individuals face both general risk factors that CH individuals also experience, and unique minority-specific risk factors related to their marginalised status (e.g., LGBT-specific harassment, anticipated stigma, internalised homophobia and transphobia). These additional minority-specific stressors contribute to elevated levels of psychological distress. Research supports the association between minority stressors and NSSI as a coping strategy (Ahrenholtz et al., 2025; Rogers and Taliaferro, 2020; Hird et al., 2024). Complementing these frameworks, research characterising NSSI as a means of emotion regulation (McKenzie and Gross, 2014; Nock, 2010; Wolff et al., 2019) explains how NSSI arises to manage this distress. In the context of our research, this leads us to expect that LGBTQ+ populations will experience higher levels of psychological distress than CH individuals, operationalised as symptoms of anxiety and depression (Kessler et al., 2002), and that this disparity will contribute to higher rates of NSSI. This is supported by existing literature showing that NSSI is preceded by psychological distress (Cassels, 2018; Cassels et al., 2022; Valencia-Agudo et al., 2018), and that gender disparities in levels of psychological distress cross-sectionally mediate higher levels of NSSI in adolescent girls compared to boys (Wilkinson et al., 2022) and in young adult women compared to men (Lutz et al., 2023). We also anticipate disparities within the LGBTQ+ sample, as GM individuals often face additional challenges over CSMs, including higher rates of discrimination and violence, barriers to gender-affirming care, and a recent increase in hostility towards GM identities (e.g., in media campaigns: Connolly et al., 2025; Evje et al., 2024; Puckett et al., 2018). These stressors may contribute to elevated psychological distress and an increased risk of NSSI compared to their CSM peers.

This study builds on existing research by studying the relative rates of NSSI among LGBTQ+ young adults (aged 18–30). While NSSI can occur beyond this age, young adulthood represents a developmental period associated with heightened NSSI prevalence and exploration of sexual and gender identity (Arnett, 2023; Liu, 2023). This study also advances our theoretical understanding of NSSI by examining the role of disparities in levels of psychological distress. These findings could inform future research aimed at addressing NSSI in LGBTQ+ young adults by addressing individual-level factors and mitigating exposure to minority stressors that cause psychological distress.

This study uses an online community sample embedded within a larger study of young adult mental health to assess (i) relative differences in rates of lifetime NSSI across GM, CSM, and CSH young adults, and (ii) whether these disparities in reported rates of NSSI can be accounted for by group differences in levels of psychological distress (i. e., symptoms of depression and anxiety). This is among the first studies

to directly compare rates of NSSI between CSM and GM individuals. It contributes to the growing recognition that GM are a distinct group within the LGBTQ+ community with unique experiences.

In the present study, we categorised participants based on sexual orientation and cisgender/transgender identity status, combining men and women within groups. However, given evidence of higher rates of NSSI in women than men (Bresin and Schoenleber, 2015; Xiao et al., 2022), CSM identity may confer different degrees of NSSI risk for cisgender men and women. We therefore conducted moderation analysis to assess whether combining cisgender men and women within CH and CSM identity groups was appropriate. Age was considered as a potential confounding variable, as the prevalence of NSSI typically decreases after adolescence (Moran et al., 2012), and psychological distress scores show variability across the lifespan (Byles et al., 2012; Keyes et al., 2014).

We hypothesize that (i) the GM group will report the highest levels of both lifetime NSSI and psychological distress, followed by the CSM group, and the lowest levels will be reported by the CH group. Furthermore, we hypothesize that (ii) psychological distress will partially account for the association between identity group and NSSI.

1. Methods

1.1. Procedure

This study is a secondary analysis of pre-collected, cross-sectional data. The Cambridge Psychology Research Ethics Committee provided ethical approval for the original data collection, as used by the current study (reference: PRE.2020.141). Participants provided electronic informed consent before starting the online survey. Data were collected between May and December 2021 as part of a multi-site international mental health study (Chief Investigator: Sam Chamberlain). Participants were recruited via the online platform 'Prolific' (www.prolific.com) with demographic pre-screeners set to recruit sufficient GM participants for statistical analysis (minimum $n = 100$). Inclusion criteria were age 18–30 years, UK or USA residence, and ability to undertake the study procedures with access to the Internet. There were no exclusion criteria. All eligible Prolific users were invited to participate via email and participants were compensated up to £14 or equivalent in USA dollars.

An initial 1763 survey responses were collected. We excluded 233 duplicates and 16 participants who failed more than two attention checks, resulting in 1514 with appropriate data. Only nine did not respond to the required NSSI item, and one did not report gender. A further 29 participants were excluded from analyses as they identified as cisgender but were unsure of their sexual orientation, and thus could not be appropriately assigned to an identity group. This resulted in 1475 (97.4 %) complete responses for analysis.

1.2. Measures

1.2.1. Gender and sexual orientation

Participants' gender was determined by their response to the two-part question *"What is your gender identity? Female, male, non-binary, other (please specify)"* with a write-in option if they selected *"other"*, followed by *"Do you identify as transgender? Yes/No"*. Responses were used to categorise participants as cisgender women, cisgender men, or GM. Participants' sexual orientation was assessed by their response to the item *"Which of the following best describes you? Heterosexual, gay/lesbian, bisexual, asexual, unsure"* with no write-in option. The responses to this question were used to categorise participants as heterosexual or sexual minorities. Based on a combination of their gender and sexual identity, participants were categorised as cisgender heterosexual (CH), a cisgender sexual minority (CSM), or a gender minority (GM). Gender minorities could identify as either heterosexual or sexual minorities.

1.2.2. Drugs, alcohol and self-injury questionnaire (DASI)

Lifetime engagement in NSSI was assessed via a yes/no question

from the validated DASI: *"Have you ever tried to hurt yourself on purpose without trying to kill yourself? (for example: things like burning, cutting, or scratching yourself)"* (Wilkinson et al., 2018). This was prefaced by the statement: "*Some people hurt themselves on purpose for reasons other than wanting to end their life. For this next set of questions, we are only interested in this 'non-suicidal self-injury' which purposefully injures or damages the body without intending to cause death.*" The self-harm item from the DASI has demonstrated good reliability and convergent validity (Cassels, 2018; Wilkinson et al., 2018).

1.2.3. Kessler psychological distress scale (K10)

The K10 scale includes 10 items which assess the frequency of anxious and depressive symptoms in the past month (e.g., feeling hopeless, restless, and nervous) (Kessler et al., 2002). These items are rated on a 5-point Likert scale from "none of the time" to "all of the time". K10 can be used as a measure of psychological distress in the general population, as well as a clinical screener for mental illness (Kessler et al., 2002). K10 has demonstrated validity, with strong correlations between K10 scores and depression (Cairney et al., 2007) and "serious mental illness" (Kessler et al., 2003). Internal consistency in the present sample was high (Cronbach's α = 0.93).

1.3. Data analysis

All analyses were conducted using STATA 17 with significance threshold $p < 0.05$. To test whether cisgender men and women could be combined within the CH and CSM identity groups, a binary logistic regression moderation analysis tested the interaction between sexual orientation (CH/CSM) and gender (male/female) in predicting lifetime NSSI. A significant interaction would indicate that the relationship between sexual orientation and lifetime NSSI risk differs for men and women, indicating that they should be tested as separate groups.

Age was evaluated as a potential covariate. A one-way ANOVA with Bonferroni-adjusted pairwise comparisons tested whether the identity groups differed in age. Two univariate binary logistic regressions then tested whether age (independent variable) was significantly associated with lifetime NSSI or K10 score (dependent variables). If age was significantly associated with identity group, lifetime NSSI, or K10 score, age would be included as a covariate in subsequent analyses.

To assess the relationship between identity group and lifetime NSSI rates, a binary logistic regression included lifetime NSSI (yes/no) as the dependent variable and 3-level identity as the independent variable. To assess the relationship between identity group and psychological distress, a linear regression with K10 score as the dependent variable and 3-level identity as the independent variable was conducted. Following this estimation, STATA's "lincom" command was used to test pairwise comparisons between identity groups. Lincom estimation is conducted as in the original model (i.e., regression). Age was included as a covariate if indicated by the age effect analyses above.

If the three identity groups significantly differed in lifetime NSSI rates and K10 scores as hypothesised, a bootstrapped Generalised Structural Equation Model (GSEM) would assess whether group differences in K10 score accounted for the relationship between 3-level identity and binary lifetime NSSI, including age as a covariate if necessary. We used STATA's GSEM framework, which applies maximum likelihood estimation with robust standard errors for models including categorical outcomes. Specifically, the binary NSSI outcome was modeled using a logit link and Bernoulli family, and psychological distress was modeled using an identity link and Gaussian family. Bootstrapping (2000 replications) was employed to generate confidence intervals for indirect effects.

We note this is cross-sectional mediation, which has been recently reframed as "associational variable analysis" due to lack of temporal ordering and causal implications (Weems, 2025). Thus, distress is an intermediary variable and does not necessarily explain the link between identity and NSSI. Such models can nonetheless identify potential

mediators to be tested in subsequent longitudinal models. We therefore followed methods described by Hayes and Preacher (2014) for mediation analyses with multi-categorical independent variables. After estimating the above GSEM, STATA's "nlcom" function was used to calculate the relative direct, indirect, and total effects as nonlinear combinations of model parameters, applying the delta method to calculate standard errors, producing estimates consistent with the main model. Absolute fit statistics (e.g., CFI, RMSEA) are not available in STATA's GSEM function.

If K10 score was found to statistically mediate the relationship between 3-level identity and binary lifetime NSSI, a sensitivity analysis would examine the potential confounding effects of gender (male/female) on the statistical mediation findings, specifically for the comparison of CH versus CSM participants. After removing GM participants, a bootstrapped GSEM would assess whether K10 score statistically mediated the association between binary identity (CH vs. CSM) and NSSI. Both age and gender (male/female) would be included as covariates. Subsequently, the indirect effect would be calculated to confirm the mediating effect if psychological distress remained significant.

A further sensitivity analysis would address concerns about potential bidirectionality between NSSI and psychological distress and evaluate whether the mediation held when reversing the original model. A bootstrapped GSEM would assess whether NSSI accounted for the relationship between 3-level identity and K10 score, including age as a covariate if necessary.

1.4. Data availability statement

For availability requests for anonymised data please contact Chief Investigator Prof Sam Chamberlain.

2. Results

2.1. Participants

Participants were 1475 young adults aged 18 to 30 years ($M = 24.48$, $SD = 3.72$) currently living in the United States of America or United Kingdom (Table 1).

Of these, 1100 (74.58 %) identified as CH, 272 (18.44 %) as CSM, and 103 (6.98 %) as GM. Within the CSM group, 197 identified as bisexual, 35 as gay, 30 as lesbian, and 10 as asexual. Within the GM group, 69 identified as non-binary, 20 as transgender men, 9 as transgender women, and fewer than 5 identified as genderfluid, genderqueer, or bigender. The GM group is composed of both heterosexuals and sexual minorities. 53 identified as bisexual, 23 as gay/lesbian, 12 as asexual, 11 identified as heterosexual, and 4 as unsure.

Table 1

Demographic Characteristics of Participants in the United Kingdom and the United States.

	UK $n = 710$	USA $n = 765$
Age *(M)*	24.71	24.27
Cisgender Heterosexual	75.49 %	73.73 %
Cisgender Sexual Minority	17.75 %	19.08 %
Gender Minority	6.76 %	7.19 %
White or Caucasian	77.89 %	59.22 %
Asian, South Asian or Southeast Asian	12.39 %	9.15 %
Black, African or Caribbean	4.23 %	14.12 %
Hispanic or Latino	0.14 %	11.76 %
Mixed/Multiple ethnic groups	4.23 %	3.92 %
Middle Eastern	0.28 %	1.18 %
Native or Indigenous group	0 %	0.39 %
Other ethnic groups	0.85 %	0.26 %

2.2. Associations between identity group, lifetime NSSI, and psychological distress

Rates of lifetime NSSI were significantly higher for GM participants (79.61 %) than CSM participants (58.82 %) and CH participants (28.64 %). Rates of lifetime NSSI were also significantly higher among CSM participants than CH participants (Table 2).

A parallel association was observed for psychological distress (K10; Table 2). Levels of psychological distress were significantly higher for GM participants than CSM participants and CH participants. Levels of psychological distress were also significantly higher for CSM participants than CH participants. Cohen's *d* effect sizes indicated small-to-large differences in psychological distress ($d = 0.39$ for CH vs CSM, 0.99 for CH vs GM, and 0.63 for CSM vs GM). As psychological distress significantly associated with both identity and lifetime NSSI, these analyses indicated that it was appropriate to investigate psychological distress as a potential mediator.

2.3. Gender by sexual orientation moderation analyses

Whilst rates of lifetime NSSI differed for cisgender men and women of different sexual orientations (Table 3), the uncorrected relative risk for NSSI in sexual minority to heterosexual was 1.9 when cisgender men and cisgender women were pooled. In a model predicting NSSI including age, the interaction between gender (male/female) and binary sexual orientation (CH/CSM) was non-significant (OR = 0.69, 95 % CI [0.39,1.22], $p = 0.20$). This suggests that the relationship between sexual orientation and lifetime NSSI risk does not differ for cisgender men and women. In the rest of our analyses, men and women were combined in the CH and CSM identity groups to maximise statistical power.

Gender (male/female) ($t(1352.19) = -4.74$, $p < 0.001$) and binary sexual orientation (CH/CSM) ($t(634.25) = 6.93$, $p < 0.001$) were both significantly associated with age, and thus age was included as a covariate in this moderation analysis.

2.4. Age effects

A one-way ANOVA found that the identity groups significantly differed in age ($F(2,1472) = 26.40$, $p < 0.001$). Post-hoc comparisons showed the direction of these group differences (Table 2), with the GM and CSM groups being significantly younger than the CH group, though the CSM and GM groups did not significantly differ in age.

Additionally, lifetime NSSI (OR = 0.93 [0.91,0.96], $p < 0.001$) and K10 scores (Coef. = -0.34 [-0.46,-0.22], $p < 0.001$) were significantly associated with age. Individuals who reported lifetime NSSI history (M

Table 3

Rates of Lifetime NSSI Engagement for Cisgender Men and Women, by Sexual Orientation.

	Heterosexual	Homosexual	Bisexual	Asexual	Total
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n*
Cisgender Men	142 (22.65)	14 (40.00)	31 (46.97)	<5 (20.00)	733
Cisgender Women	173 (36.58)	21 (70.00)	91 (69.47)	<5 (40.00)	639

= 23.89, $SD = 3.59$) were significantly younger than those who had not reported engaging in NSSI ($M = 24.84$, $SD = 3.75$). As such, age was included as a covariate in calculating the associations between identity group, lifetime NSSI and psychological distress, and in the statistical mediation analysis.

2.5. Statistical mediation analyses

Psychological distress partially statistically mediated the relationship between identity group and lifetime NSSI (Fig. 1, Table 4), significantly contributing to higher rates of lifetime NSSI in the GM group compared to the CSM group, the GM group compared to the CH group, and the CSM group compared to the CH group.

2.6. Sensitivity mediation analyses

When controlling for gender (male/female), psychological distress continued to partially statistically mediate the relationship between CH and CSM identify and lifetime NSSI (Coef. = 0.26, 95 %CI[0.15,0.38], $p < 0.001$) (Fig. 2, Table 5).

A second sensitivity analysis reversed the primary mediation model to investigate whether NSSI would statistically mediate the association between identity group and distress, as a cross-sectional check for potential bidirectionality of effects. Results showed all indirect effects were non-significant (CH vs CSM ($p = 0.576$), CH vs GM ($p = 0.540$), and CSM vs GM ($p = 0.505$)).

3. Discussion

This study examined disparities in lifetime NSSI among young adults with LGBTQ+ identities, and whether these disparities could be partially accounted for by disparities in levels of psychological distress (i.e., symptoms of depression and anxiety). Results supported our hypotheses, with significant group differences in levels of psychological distress partially accounting for disparities in rates of lifetime NSSI, and GM
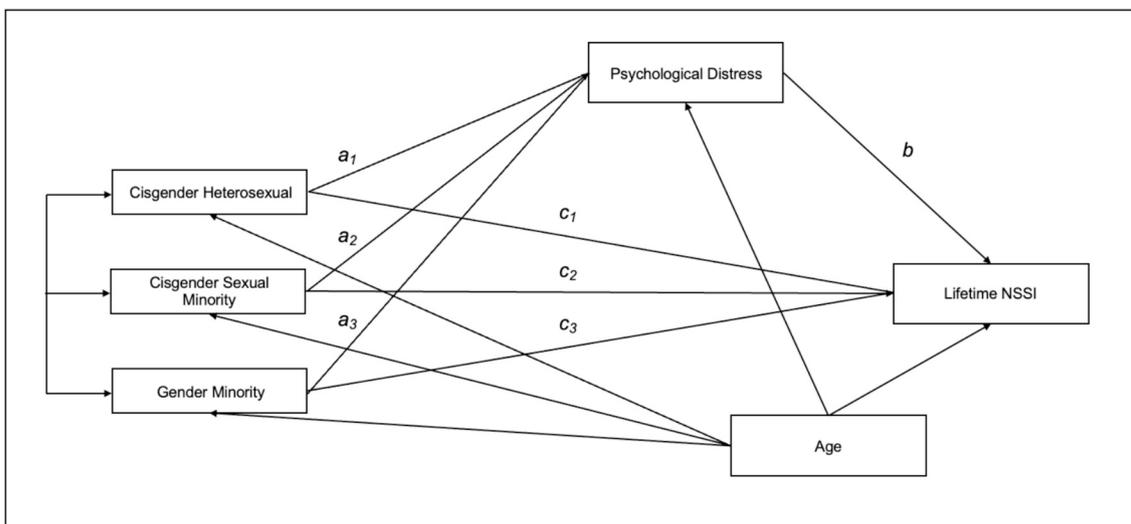
Table 2

Age, Lifetime NSSI Engagement, and Psychological Distress (K10) of the Identity Groups.

	Cisgender Heterosexual		Cisgender Sexual Minority		Gender Minority		Comparison				*p*-value
	M	SD	M	SD	M	SD					
Age	24.88	3.70	23.47	3.68	22.91	3.13	CH vs. CSM CH vs. GM CSM vs. GM				<0.001 <0.001 0.39
	M	SD	M	SD	M	SD		Std. Coef.	Unstd. Coef.	95 %CI	*p*-value
Distress	23.41	8.78	26.82	8.24	32.17	9.22	CH vs. CSM CH vs. GM CSM vs. GM	0.34 0.92 0.58	3.08 8.76 5.22	1.91, 4.25 6.99, 10.52 3.24, 7.19	<0.001 <0.001 <0.001
	%		%		%				OR	95 %CI	*p*-value
NSSI	28.64 (*n* = 315)		58.82 (*n* = 160)		79.61 (*n* = 82)		CH vs. CSM CH vs. GM CSM vs. GM		3.39 9.73 2.68	2.57, 4.47 5.92, 15.99 1.57, 4.59	<0.001 <0.001 <0.001

Note. Coefficients and 95 % confidence intervals are not presented for age as age comparisons were conducted with a one-way ANOVA; *p*-values and coefficients come from post-hoc pairwise comparisons.

Fig. 1. Path Diagram Depicting a Cross-Sectional Mediation Model Relating 3-Level Identity to Lifetime NSSI Engagement, Including Age as a Covariate.
Note. The subscripts relate to the statistics reported in Table 4.

Table 4
Results of a Generalised Structural Equation Model Testing Psychological Distress (K10) as a Mediator Between 3-Level Identity and Lifetime NSSI Engagement, Including Age as a Covariate.

Identity Group	CH vs. CSM				CH vs. GM				CSM vs. GM			
	Coef (StdErr)	95 %CI	*p*-value	% of Total Effects	Coef (StdErr)	95 %CI	*p*-value	% of Total Effects	Coef (StdErr)	95 %CI	*p*-value	% of Total Effects
Relative direct effect (c_x)	1.11 (0.15)	0.82, 1.40	<0.001		1.78 (0.27)	1.24, 2.32	<0.001		0.68 (0.29)	0.10, 1.25	0.021	
Relative indirect effect ($a_x b$)	0.26 (0.05)	0.16, 0.36	<0.001	18.98	0.69 (0.10)	0.50, 0.89	<0.001	27.82	0.44 (0.09)	0.26, 0.62	<0.001	39.64
Relative total effects ($c_x + a_x b$)	1.37 (0.16)	1.05, 1.68	<0.001		2.48 (0.29)	1.91, 3.05	<0.001		1.11 (0.31)	0.51, 1.72	<0.001	

Note. Fig. 1 illustrates the paths reported in Table 4. All coefficients reported in Table 4 are unstandardized estimates.
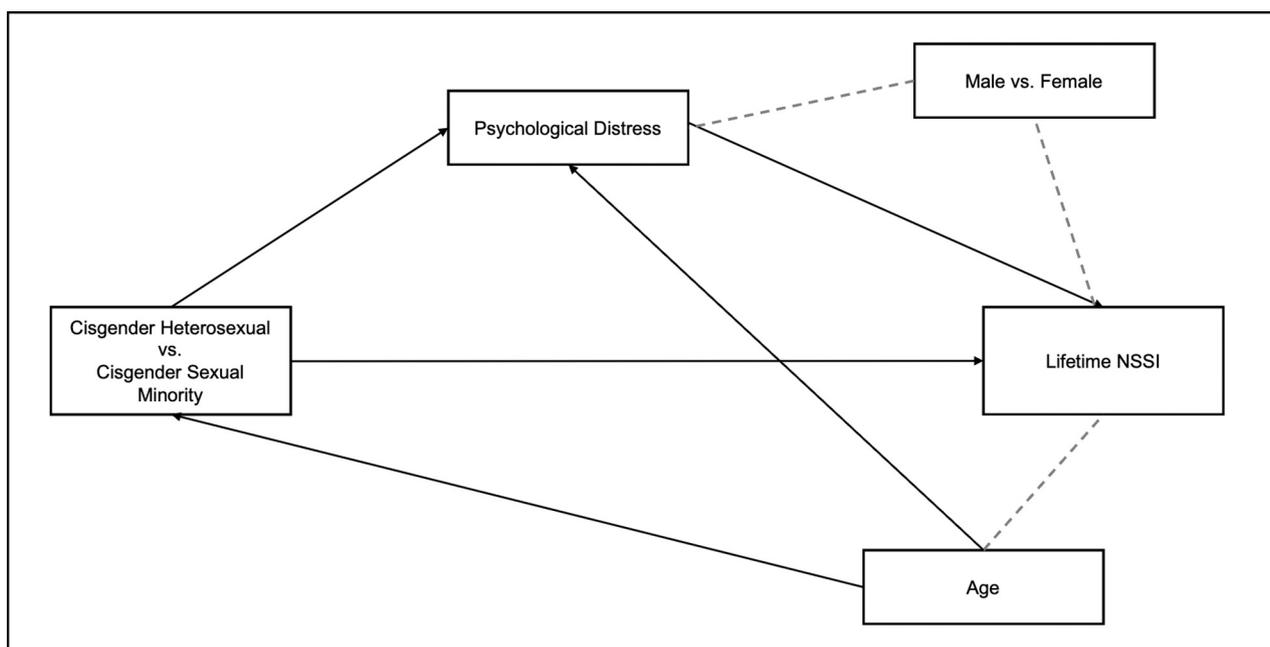

Fig. 2. Path Diagram Depicting the Sensitivity Analysis Testing the Confounding Effects of Male/Female Gender on the Primary Mediation Finding.
Note. Solid lines indicate significance at $p < 0.05$. Statistics are presented in Table 5.

Table 5

Results of the Sensitivity Analysis Testing the Confounding Effects of Male/Female Gender on the Primary Mediation Finding.

Pathway	Coef.	95 %CI	*p*-value
Cisgender Heterosexual vs. Cisgender Sexual Minority → Psychological Distress	3.12	1.90, 4.35	**<0.001**
Cisgender Heterosexual vs. Cisgender Sexual Minority → NSSI	1.09	0.78, 1.40	**<0.001**
Psychological Distress → NSSI	0.08	0.07, 0.10	**<0.001**
Male vs. Female → Psychological Distress	−0.27	−1.24, 0.69	0.580
Male vs. Female → NSSI	−0.07	−0.33, 0.18	0.584
Age → Psychological Distress	−0.20	−0.33, −0.07	**0.003**
Age → NSSI	−0.02	−0.06, 0.01	0.243

Note. Fig. 2 illustrates the statistics reported in this table.

young adults showing particularly high risk of both elevated psychological distress and NSSI compared to CSM young adults.

Consistent with our hypothesis, both the CSM and GM groups exhibited higher rates of lifetime NSSI and higher levels of psychological distress than the CH group. This aligns with past research showing higher levels of NSSI, psychological distress, and other mental health difficulties among LGBTQ+ people compared to their CH peers (Choukas-Bradley et al., 2022; Zullo et al., 2024). Our findings extend this work by showing the hypothesised significant stepwise association between identity and both lifetime NSSI and psychological distress, whereby the GM group exhibited higher rates of lifetime NSSI and psychological distress than the CSM group, who, in turn, demonstrated higher levels than the CH group.

Also as hypothesised, cross-sectional mediation analysis showed that the higher rates of lifetime NSSI in the CSM and GM groups were partly accounted for by their higher levels of psychological distress. This statistical mediation also operates in a stepwise progression, with the higher rates of lifetime NSSI in the GM group compared to the CSM group being partly accounted for by the GM group's elevated levels of psychological distress, and the higher rates of lifetime NSSI in the CSM group compared to the CH group being partly accounted for by the CSM group's elevated levels of psychological distress. These findings align with perspectives that marginalised identities experience higher levels of psychological distress, which may translate to higher rates of NSSI as a coping strategy.

Overall, our findings align with dominant theoretical frameworks. Although minority-specific stressors were not measured directly, the elevated levels of psychological distress reported by CSM and GM young adults correspond with evidence from Meyer (2003) and Testa et al. (2015) that LGBTQ+ populations experience disproportionately high levels of stress which can adversely affect their psychological well-being. The finding that elevated levels of psychological distress partially accounted for higher rates of NSSI is consistent with theories that individuals engage in NSSI for emotion regulation (i.e., to alleviate psychological distress) (McKenzie and Gross, 2014; Nock, 2010; Wolff et al., 2019). Results are also consistent with broader findings that gender differences in psychological distress levels significantly mediate higher rates of NSSI in adolescent girls compared to boys (Wilkinson et al., 2022) and in young adult women compared to men (Lutz et al., 2023). Observing the same pattern across different groups indicates that at its core, NSSI is a response to psychological distress. Understanding who is at high risk of NSSI is therefore predicated on understanding who is at high risk of psychological distress.

3.1. Interplay between gender and sexual orientation

We found no evidence that sexual minority identity conferred a different degree of NSSI risk for cisgender men and women. This made it reasonable for us to combine men and women to create the CH and CSM identity groups. While this suggests that CSM status does not differentially inflate the risk of NSSI for men and women in young adults, we cannot rule out a small effect which this study was not adequately powered to find.

It was therefore prudent to conduct a sensitivity analysis controlling

for gender. This confirmed the findings that higher rates of lifetime NSSI in the CSM group compared to the CH identity group were still partly statistically explained by their higher levels of psychological distress. This suggests that the influence of CSM identity on NSSI risk persists even when accounting for male/female gender.

3.2. Implications

Our findings show that high levels of psychological distress among CSM and especially GM young adults partially account for these groups' high rates of NSSI, suggesting that reducing these groups' levels of psychological distress may reduce their levels of NSSI. Professionals working with CSM and GM individuals should therefore be cognisant of their high rates of psychological distress and NSSI, and work to minimise both. Education and training could increase professionals' awareness of this issue and their ability to provide identity-specific and appropriate support. Using inclusive questions about CSM and GM identity and standardised assessments to screen for NSSI engagement and levels of psychological distress may help clinicians to identify individuals at risk of NSSI and intervene earlier.

To improve treatment, additional research into the mechanisms of NSSI recovery for LGBTQ+ populations is needed. Evidence for the efficacy of psychological or pharmacological treatments that directly target NSSI is relatively sparse, with Cognitive Behavioral Therapy (CBT) and Dialectical Behavioral Therapy (DBT) being among the most studied treatments (Camp et al., 2024; Hawton et al., 2016; Witt et al., 2021). Although there is some evidence of these approaches being appropriate for LGBTQ+ people such as in coping with experiences of stigma and subsequent emotional distress (Sloan et al., 2017; Tilley et al., 2022), further inclusion of lived experience perspectives and continued adaptations to working with LGBTQ+ individuals are needed (Hasking et al., 2025). Importantly, recent trials have also suggested that DBT may, in some cases, increase NSSI (Simon et al., 2022). Given our findings, it may be that reducing symptoms of anxiety and depression could in turn help to reduce NSSI - this suggestion would benefit from empirical evaluation.

It is essential to acknowledge that CSM and GM individuals are not at an elevated risk of NSSI and psychological distress because of their identities, but rather because of the stressful experiences they contend with due to homophobia and transphobia (Meyer, 2003; Testa et al., 2015). As such, whilst the aforementioned individual interventions to reduce and manage psychological distress may provide short-term results, the onus should not fall on LGBTQ+ individuals to cope with the discrimination they encounter. Interventions should also address the causes of psychological distress and NSSI, not merely treat the consequences, and thus societal change should be the focus of future interventions aimed to reduce distress and NSSI among LGBTQ+ people. Future work should examine the influence of population-level policy initiatives (e.g., targeting the education of clinicians, teachers, and students on the amount of psychological distress experienced by LGBTQ+ individuals). Evidence also suggests that family-level interventions are of value, as family acceptance and support are known protective factors for LGBTQ+ youth (Ryan et al., 2010). Legal changes that combat discrimination and ensure equal opportunities for LGBTQ+

individuals would also help enact large-scale change, such as laws criminalising LGBTQ-specific discrimination and banning so-called 'conversion therapy' (Barron and Hebl, 2013).

3.3. Strengths and limitations

While research on NSSI in LGBTQ+ populations is growing, few studies directly compare mental health outcomes of CSM and GM individuals. Most either combine CSM and GM participants into a single LGBTQ+ category for comparison with a CH group, or only focus on either CSM or GM individuals. Our work distinguishes between CSM and GM individuals, contributing a more nuanced understanding of their unique experiences.

Additionally, previous research has typically taken one of two methodological approaches: examining between-group differences (e.g., whether rates of NSSI differ between LGBTQ+ and CH samples) or within-group processes and their effect on mental health (e.g., whether minority-specific stress explains NSSI within a LGBTQ+ sample). Our study combined these approaches by assessing whether the difference in a within-group process (psychological distress) statistically explained between-group differences in rates of NSSI. This helped us to investigate whether CSM and GM individuals are at higher risk for NSSI and one potential reason for this.

A further strength is the use of a community sample. Much past research on self-harm in GM populations has used small clinical samples, which may overrepresent the minority of individuals who access mental health treatment and/or gender-affirming care (Becerra-Culqui et al., 2018; Jackman et al., 2018a). While we recognise the restricted age of participants (18–30) limits the generalisability of findings to other age groups, the young adult sample is also a strength. Younger LGBTQ+ individuals may still be developing their identities (Hall et al., 2021; Steensma et al., 2013) and may not have "come out", risking misclassification as cisgender or heterosexual. Young adults may be more likely than adolescents to accurately identify themselves as CSM and GM (Lucassen et al., 2011). Lastly, in comparison to much of the published literature, our study had a relatively large sample size, particularly with regards to our GM sub-sample, which was achieved through intentional recruitment. This increased the statistical power of our analyses, and therefore our accuracy in detecting differences between the CH, CSM, and GM groups.

However, the study's cross-sectional design prevents us from establishing the direction of causality or true temporal mediation (Weems, 2025). While longitudinal research suggests a possible bidirectional relationship between NSSI and psychological distress (Polek et al., 2020) psychological distress is theoretically plausible as a mediator based on the prevailing emotion regulation models of NSSI (McKenzie and Gross, 2014; Nock, 2010; Wolff et al., 2019) and the association from distress to NSSI is five times stronger than the inverse (Cassels, 2018; Cassels et al., 2022). Hence it is more likely that psychological distress is acting as the mediator. The inverse model (NSSI accounting for identity effects on psychological distress) reported here showed non-significant indirect effects, giving tentative support for the proposed model. However, among LGBTQ+ individuals this bidirectional relationship may be especially pronounced, as NSSI has been shown to increase feelings of alienation over and above minority-related stressors among CSM (Alexander and Clare, 2004; Batejan et al., 2015). NSSI may also expose CSM and GM groups to further discrimination (Burke et al., 2019). Longitudinal research or more novel approaches to aid interpretation of cross-sectional mediation models, such as sensitivity analyses to estimate plausible temporal effects (Georgeson et al., 2023), are required to disentangle these relationships.

In addition, we combined all the individuals identifying as GM and as CSM into single identity groups, reflecting their shared exposure to stigma and discrimination in a heteronormative society (Meyer, 2003; Testa et al., 2015). However, certain sub-groups within the LGBTQ+ population (e.g., non-binary or bisexual individuals) may be at an elevated risk of NSSI (Dunlop et al., 2020; Liu et al., 2019; Veale et al., 2017), which our study may have obscured. Moderation analyses indicated that sexual orientation conferred similar degrees of NSSI risk for cisgender men and women, justifying their grouping into single GM and CSM group, however, the moderation analyses may have been underpowered. Future research should further parse the levels of psychological distress and NSSI experienced by unique LGBTQ+ identity groups.

3.4. Future directions

Our study found that psychological distress only partially accounted for rates of NSSI, indicating that other variables also contribute to NSSI risk within CSM and GM populations. Past work provides several plausible avenues such as bullying, minority-specific discrimination and harassment, and general mental health factors (e.g., depression, substance use), sexual assault and intimate partner violence (Rogers and Taliafero, 2020), lack of social support (Claes et al., 2015) and lower self-esteem (Davey et al., 2016). Future research should explore additional factors that may contribute to NSSI among CSM and GM populations.

While our findings indicate that higher levels of psychological distress account for some of the increased likelihood of higher levels of NSSI among CSM and GM individuals, they do not explain *why* CSM and GM are disproportionately experiencing this distress. Meyer's minority stress theory (Meyer, 2003) provides an evidence-based explanation, suggesting that LGBTQ+ individuals experience higher levels of psychological distress as they must contend with unique stressors related to their identities (e.g., harassment and internalised homophobia). This is consistent with research suggesting that minority stressors play a pivotal role in the occurrence of NSSI within this group (Ahrenholtz et al., 2025; Jackman et al., 2018b; Rogers and Taliaferro, 2020). Future research should assess whether these stressors cause the psychological distress which partly explains NSSI.

Future work should assess gender identity and sexual orientation in inclusive, methodologically sound ways. Evidence indicates that transgender and bisexual individuals often feel misrepresented by standard measures (Galupo et al., 2014), highlighting the need to replace binary identity options with a flexible, non-mutually exclusive, multiple-category system that allows individuals to identify themselves accurately (Hyde et al., 2019). Additionally, our analytic approach treated CSM and GM identities as distinct constructs to clarify their unique contributions to mental health outcomes. This is consistent with prior literature and theoretical frameworks, such as Minority Stress Theory (Meyer, 2003) and the GMSR model (Testa et al., 2015). However, future research could examine the intersection of sexual and gender minority identities using larger samples and nuanced measures of sexual orientation. To ensure this is done effectively and sensitively, lived experience perspectives should be integrated throughout the research process, including involving researchers who identify as LGBTQ+ (Galupo, 2017).

4. Conclusions

This study aimed to explore the increased rates of NSSI among LGBTQ+ young adults compared to their CH peers. Findings showed a stepwise pattern, with GM participants reporting the highest levels of both psychological distress and lifetime NSSI, followed by the CSM group, with the lowest levels reported by the CH group. As hypothesised, group differences in levels of psychological distress partially accounted for group differences in rates of lifetime NSSI. These results suggest that the disproportionate burden of psychological distress experienced by LGBTQ+ young adults compared to their CH peers contributes to this population's high levels of NSSI. This pattern extends to partially accounting for significantly higher levels of NSSI among GM young adults than their CSM peers, emphasising the importance for future NSSI research to focus on GM populations specifically. While societal

interventions addressing the causes of this disproportionate distress are essential, future research is first needed to identify those causes and inform effective interventions.

CRediT authorship contribution statement

Tara Ramsay-Patel: Writing – original draft, Visualization, Formal analysis, Data curation, Conceptualization. **Samuel R. Chamberlain:** Writing – review & editing, Supervision, Resources, Methodology, Funding acquisition. **Jon E. Grant:** Writing – review & editing, Resources, Methodology, Funding acquisition. **Christine Lochner:** Writing – review & editing, Resources, Methodology, Funding acquisition. **Sharon A.S. Neufeld:** Writing – review & editing, Supervision, Methodology. **Paul O. Wilkinson:** Writing – review & editing, Supervision, Funding acquisition. **Tamsin J. Ford:** Writing – review & editing, Supervision. **Nina M. Lutz:** Writing – review & editing, Supervision, Project administration, Investigation, Data curation, Conceptualization.

Funding

Declaration of competing interest

The authors declare no conflicts of interest.

Acknowledgements

None.

References

Ahrenholtz, M.S., Nicholas, J., Sacco, A., Bresin, K., 2025. Sexual and Gender Minority Stress in Nonsuicidal Self-Injury Engagement: A Meta-Analytic Review. Suicide Life Threat. Behav. 55 (1), e13161.

Alexander, N., Clare, L., 2004. You still feel different: the experience and meaning of women's self-injury in the context of a lesbian or bisexual identity. J. Community Appl. Soc. Psychol. 14 (2), 70–84.

Arnett, J.J., 2023. Emerging adulthood: The winding road from the late teens through the twenties. Oxford University Press.

Asarnow, J.R., Porta, G., Spirito, A., Emslie, G., Clarke, G., Wagner, K.D., Brent, D.A., 2011. Suicide attempts and nonsuicidal self-injury in the treatment of resistant depression in adolescents: findings from the TORDIA study. J. Am. Acad. Child Adolesc. Psychiatry 50 (8), 772–781.

Barron, L.G., Hebl, M., 2013. The force of law: The effects of sexual orientation antidiscrimination legislation on interpersonal discrimination in employment. Psychol. Public Policy Law 19 (2), 191.

Batejan, K.L., Jarvi, S.M., Swenson, L.P., 2015. Sexual orientation and non-suicidal self-injury: A meta-analytic review. Arch. Suicide Res. 19 (2), 131–150.

Becerra-Culqui, T.A., Liu, Y., Nash, R., Cromwell, L., Flanders, W.D., Getahun, D., Goodman, M., 2018. Mental health of transgender and gender nonconforming youth compared with their peers. Pediatrics 141 (5).

Bjureberg, J., Kuja-Halkola, R., Ohlis, A., Lichtenstein, P., D'Onofrio, B.M., Hellner, C., Cederlöf, M., 2021. Adverse clinical outcomes among youths with nonsuicidal self-injury and suicide attempts: a longitudinal cohort study. J. Child Psychol. Psychiatry 63 (8), 921–928.

Bresin, K., Schoenleber, M., 2015. Gender differences in the prevalence of nonsuicidal self-injury: A meta-analysis. Clin. Psychol. Rev. 38, 55–64.

Burke, T.A., Piccirillo, M.L., Moore-Berg, S.L., Alloy, L.B., Heimberg, R.G., 2019. The stigmatization of nonsuicidal self-injury. J. Clin. Psychol. 75 (3), 481–498.

Byles, J.E., Gallienne, L., Blyth, F.M., Banks, E., 2012. Relationship of age and gender to the prevalence and correlates of psychological distress in later life. Int. Psychogeriatr. 24 (6), 1009–1018.

Cairney, J., Veldhuizen, S., Wade, T.J., Kurdyak, P., Streiner, D.L., 2007. Evaluation of 2 measures of psychological distress as screeners for depression in the general population. Can. J. Psychiatr. 52 (2), 111–120.

Camp, J., Durante, G., Cooper, A., Smith, P., Rimes, K.A., 2024. Clinical outcomes for sexual and gender minority adolescents in a dialectical behaviour therapy programme. Behav. Cogn. Psychother. 1–19.

Cassels, M., Neufeld, S., van Harmelen, A.L., Goodyer, I., Wilkinson, P., 2022. Prospective pathways from impulsivity to non-suicidal self-injury among youth. Arch. Suicide Res. 1–14.

Cassels, M.T., 2018. *Predictors and correlates of adolescent non-suicidal self-injury* (Doctoral dissertation).

Choukas-Bradley, S., Thoma, B.C., MacMullin, L.N., VanderLaan, D.P., van der Miesen, A. I., 2022. Mental health among LGBT youth. In: Gender and sexuality development: Contemporary theory and research, pp. 539–565.

Claes, L., Bouman, W.P., Witcomb, G., Thurston, M., Fernandez-Aranda, F., Arcelus, J., 2015. Non-suicidal self-injury in trans people: Associations with psychological symptoms, victimization, interpersonal functioning, and perceived social support. J. Sex. Med. 12 (1), 168–179.

Connolly, D.J., Meads, C., Wurm, A., Brown, C., Bayliss, J., Oakes-Monger, T.C., Berner, A.M., 2025. Transphobia in the United Kingdom: a public health crisis. Int. J. Equity Health 24 (1), 155.

Cooper, J., Kapur, N., Webb, R., Lawlor, M., Guthrie, E., Mackway-Jones, K., Appleby, L., 2005. Suicide after deliberate self-harm: a 4-year cohort study. Am. J. Psychiatry 162 (2), 297–303. https://doi.org/10.1176/appi.ajp.162.2.297.

Daukantaitè, D., Lundh, L.G., Wångby-Lundh, M., Claréus, B., Bjärehed, J., Zhou, Y., Liljedahl, S.I., 2021. What happens to young adults who have engaged in self-injurious behavior as adolescents? A 10-year follow-up. Eur. Child Adolesc. Psychiatry 30 (3), 475–492.

Davey, A., Arcelus, J., Meyer, C., Bouman, W.P., 2016. Self-injury among trans individuals and matched controls: Prevalence and associated factors. Health Soc. Care Community 24 (4), 485–494.

Dunlop, B.J., Hartley, S., Oladokun, O., Taylor, P.J., 2020. Bisexuality and Non-Suicidal Self-Injury (NSSI): A narrative synthesis of associated variables and a meta-analysis of risk. J. Affect. Disord. 276, 1159–1172.

Edmondson, A.J., Brennan, C.A., House, A.O., 2016. Non-suicidal reasons for self-harm: A systematic review of self-reported accounts. J. Affect. Disord. 191, 109–117. https://doi.org/10.1016/j.jad.2015.11.043.

Evje, J., Fluit, S., von Soest, T., 2024. Transgender people experience more discrimination and violence than cisgender lesbian, gay, or bisexual people: a multilevel analysis across 30 European countries. Int. J. Transgender Health 1–15.

Galupo, M.P., 2017. Researching while cisgender: Identity considerations for transgender research. International Journal of Transgenderism 18 (3), 241–242.

Galupo, M.P., Davis, K.S., Grynkiewicz, A.L., Mitchell, R.C., 2014. Conceptualization of sexual orientation identity among sexual minorities: Patterns across sexual and gender identity. Journal of Bisexuality 14 (3–4), 433–456.

Georgeson, A.R., Alvarez-Bartolo, D., MacKinnon, D.P., 2023. A sensitivity analysis for temporal bias in cross-sectional mediation. Psychol. Methods 30 (6), 1326–1344.

Hall, W.J., Dawes, H.C., Plocek, N., 2021. Sexual orientation identity development milestones among lesbian, gay, bisexual, and queer people: A systematic review and meta-analysis. Front. Psychol. 12, 753954.

Hasking, P., Aiyana, A., Haywood, S., Hon, K., Hon, K., Mirichlis, S., Lewis, S.P., 2025. Voices for change: inclusion of lived experience self-injury research, practice, education, and advocacy. Aust. J. Psychol. 77 (1), 2456728.

Hawton, K., Witt, K.G., Salisbury, T.L.T., Arensman, E., Gunnell, D., Hazell, P., van Heeringen, K., 2016. Psychosocial interventions following self-harm in adults: a systematic review and meta-analysis. Lancet Psychiatry 3 (8), 740–750.

Hayes, A.F., Preacher, K.J., 2014. Statistical mediation analysis with a multicategorical independent variable. Br. J. Math. Stat. Psychol. 67 (3), 451–470.

Hird, K., Boyes, M., Strauss, P., Hasking, P., 2024. Trans young people's experiences of nonsuicidal self-injury. Psychol. Sex. Orientat. Gend. Divers.

Hooley, J.M., Fox, K.R., Boccagno, C., 2020. Nonsuicidal self-injury: diagnostic challenges and current perspectives. Neuropsychiatr. Dis. Treat. 16, 101.

Hyde, J.S., Bigler, R.S., Joel, D., Tate, C.C., van Anders, S.M., 2019. The future of sex and gender in psychology: Five challenges to the gender binary. Am. Psychol. 74 (2), 171.

International Society for the Study of Self-Injury, 2018. What is self-injury? https://itriples.org/about-self-injury/what-is-self-injury.

Jackman, K.B., Dolezal, C., Levin, B., Honig, J.C., Bockting, W.O., 2018a. Stigma, gender dysphoria, and nonsuicidal self-injury in a community sample of transgender individuals. Psychiatry Res. 269, 602–609. https://doi.org/10.1016/j.psychres.2018.08.092.

Jackman, K.B., Edgar, B., Ling, A., Honig, J., Bockting, W., 2018b. Experiences of transmasculine spectrum people who report nonsuicidal self-injury: A qualitative investigation. J. Couns. Psychol. 65 (5), 586.

Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S.L., Zaslavsky, A.M., 2002. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol. Med. 32 (6), 959–976.

Kessler, R.C., Barker, P.R., Colpe, L.J., Epstein, J.F., Gfroerer, J.C., Hiripi, E., Zaslavsky, A.M., 2003. Screening for serious mental illness in the general population. Arch. Gen. Psychiatry 60 (2), 184–189.

Keyes, K.M., Nicholson, R., Kinley, J., Raposo, S., Stein, M.B., Goldner, E.M., Sareen, J., 2014. Age, period, and cohort effects in psychological distress in the United States and Canada. Am. J. Epidemiol. 179 (10), 1216–1227.

Klonsky, E.D., 2007. The functions of deliberate self-injury: A review of the evidence. Clin. Psychol. Rev. 27 (2), 226–239.

Lewis, S.P., Collaton, J., Pugh, R.L., Heath, N.L., Whitley, R., 2025. The lived experience of self-injury stigma and its psychosocial impact: a thematic analysis. BMC Psychol. 13 (1), 563.

Liu, R.T., 2023. The epidemiology of non-suicidal self-injury: lifetime prevalence, sociodemographic and clinical correlates, and treatment use in a nationally representative sample of adults in England. Psychol. Med. 53 (1), 274–282.

Liu, R.T., Sheehan, A.E., Walsh, R.F., Sanzari, C.M., Cheek, S.M., Hernandez, E.M., 2019. Prevalence and correlates of non-suicidal self-injury among lesbian, gay, bisexual, and transgender individuals: A systematic review and meta-analysis. Clin. Psychol. Rev. 74, 101783.

Lucassen, M.F., Merry, S.N., Robinson, E.M., Denny, S., Clark, T., Ameratunga, S., Rossen, F.V., 2011. Sexual attraction, depression, self-harm, suicidality and help-seeking behaviour in New Zealand secondary school students. Australian & New Zealand Journal of Psychiatry 45 (5), 376–383.

Lutz, N.M., Neufeld, S.A., Hook, R.W., Jones, P.B., Bullmore, E.T., Goodyer, I.M., Wilkinson, P.O., 2023. Why is non-suicidal self-injury more common among women? Mediation and moderation analyses of psychological distress, emotion dysregulation, and impulsivity. Arch. Suicide Res. 27 (3), 905–921.

McKenzie, K.C., Gross, J.J., 2014. Nonsuicidal self-injury: an emotion regulation perspective. Psychopathology 47 (4), 207–219.

Meyer, I.H., 2003. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. Psychol. Bull. 129 (5), 674.

Moran, P., Coffey, C., Romaniuk, H., Olsson, C., Borschmann, R., Carlin, J.B., Patton, G. C., 2012. The natural history of self-harm from adolescence to young adulthood: a population-based cohort study. Lancet 379 (9812), 236–243.

Muehlenkamp, J.J., Tillotson, V., 2024. Overview and epidemiology of NSSI in clinical samples. In: Lloyd-Richardson, E.E., Baetens, I., Whitlock, J.L. (Eds.), *The Oxford handbook of nonsuicidal self-injury* (Oxford Library of Psychology). Oxford University Press.

Nock, M.K., 2010. Self-injury. Annu. Rev. Clin. Psychol. 6, 339–363.

Polek, E., Neufeld, S.A., Wilkinson, P., Goodyer, I., St Clair, M., Prabhu, G., Jones, P.B., 2020. How do the prevalence and relative risk of non-suicidal self-injury and suicidal thoughts vary across the population distribution of common mental distress (the p factor)? Observational analyses replicated in two independent UK cohorts of young people. BMJ Open 10 (5), e032494.

Price-Feeney, M., Green, A.E., Dorison, S., 2020. Understanding the Mental Health of Transgender and Nonbinary Youth. J. Adolesc. Health 66, 684–690.

Puckett, J.A., Cleary, P., Rossman, K., Mustanski, B., Newcomb, M.E., 2018. Barriers to gender-affirming care for transgender and gender nonconforming individuals. Sex. Res. Soc. Policy 15 (1), 48–59.

Rogers, M.L., Taliaferro, L.A., 2020. Self-injurious thoughts and behaviors among sexual and gender minority youth: A systematic review of recent research. Curr. Sex. Health Rep. 12 (4), 335–350.

Ryan, C., Russell, S.T., Huebner, D., Diaz, R., Sanchez, J., 2010. Family acceptance in adolescence and the health of LGBT young adults. J. Child Adolesc. Psychiatr. Nurs. 23 (4), 205–213.

Simon, G.E., Shortreed, S.M., Rossom, R.C., Beck, A., Clarke, G.N., Whiteside, U., Smith, J., 2022. Effect of offering care management or online dialectical behavior therapy skills training vs usual care on self-harm among adult outpatients with suicidal ideation: a randomized clinical trial. Jama 327 (7), 630–638.

Sloan, C.A., Berke, D.S., Shipherd, J.C., 2017. Utilizing a dialectical framework to inform conceptualization and treatment of clinical distress in transgender individuals. Prof. Psychol. Res. Pract. 48 (5), 301.

Somer, O., Bildik, T., Kabukçu-Başay, B., Güngör, D., Başay, Ö., Farmer, R.F., 2015. Prevalence of non-suicidal self-injury and distinct groups of self-injurers in a community sample of adolescents. Soc. Psychiatry Psychiatr. Epidemiol. 50 (7), 1163–1171.

Staniland, L., Hasking, P., Boyes, M., Lewis, S., 2021. Stigma and nonsuicidal self-injury: Application of a conceptual framework. Stigma and Health 6 (3), 312.

Steensma, T.D., Kreukels, B.P., de Vries, A.L., Cohen-Kettenis, P.T., 2013. Gender identity development in adolescence. Horm. Behav. 64 (2), 288–297.

Su, D., Irwin, J.A., Fisher, C., Ramos, A., Kelley, M., Mendoza, D.A.R., Coleman, J.D., 2016. Mental Health Disparities Within the LGBT Population: A Comparison Between Transgender and Nontransgender Individuals. Transgender health 1 (1), 12–20. https://doi.org/10.1089/trgh.2015.0001.

Taylor, P.J., Jomar, K., Dhingra, K., Forrester, R., Shahmalak, U., Dickson, J.M., 2018. A meta-analysis of the prevalence of different functions of non-suicidal self-injury. J. Affect. Disord. 227, 759–769. https://doi.org/10.1016/j.jad.2017.11.073.

Testa, R.J., Habarth, J., Peta, J., Balsam, K., Bockting, W., 2015. Development of the gender minority stress and resilience measure. Psychol. Sex. Orientat. Gend. Divers. 2 (1), 65.

Tilley, J.L., Molina, L., Luo, X., Natarajan, A., Casolaro, L., Gonzalez, A., Mahaffey, B., 2022. Dialectical behaviour therapy (DBT) for high-risk transgender and gender diverse (TGD) youth: A qualitative study of youth and mental health providers' perspectives on intervention relevance. Psychol. Psychother. Theory Res. Pract. 95 (4), 1056–1070.

Valencia-Agudo, F., Burcher, G.C., Ezpeleta, L., Kramer, T., 2018. Nonsuicidal self-injury in community adolescents: a systematic review of prospective predictors, mediators and moderators. J. Adolesc. 65, 25–38.

Veale, J.F., Watson, R.J., Peter, T., Saewyc, E.M., 2017. Mental health disparities among Canadian transgender youth. J. Adolesc. Health 60 (1), 44–49.

Weems, C.F., 2025. An alternative framework for nonexperimental cross-sectional mediation studies: associational variable analysis. Psychol. Methods.

Wilkinson, P.O., Qiu, T., Neufeld, S., Jones, P., Goodyer, I., 2018. Sporadic and recurrent non-suicidal self-injury before age 14 and incident onset of psychiatric disorders by 17 years: Prospective cohort study. Br. J. Psychiatry 212 (4), 222–226. https://doi.org/10.1192/bjp.2017.45.

Wilkinson, P.O., Kelvin, R., Roberts, C., Dubicka, B., Goodyer, I., 2011. Clinical and psychosocial predictors of suicide attempts and nonsuicidal self-injury in the Adolescent Depression Antidepressants and Psychotherapy Trial (ADAPT). Am. J. Psychiatry 168 (5), 495–501.

Wilkinson, P.O., Qiu, T., Jesmont, C., Neufeld, S.A., Kaur, S.P., Jones, P.B., Goodyer, I.M., 2022. Age and gender effects on non-suicidal self-injury, and their interplay with psychological distress. J. Affect. Disord. 306, 240–245.

Witt, K.G., Hetrick, S.E., Rajaram, G., Hazell, P., Salisbury, T.L.T., Townsend, E., Hawton, K., 2021. Psychosocial interventions for self-harm in adults. Cochrane Database Syst. Rev. 4.

Wolff, J.C., Thompson, E., Thomas, S.A., Nesi, J., Bettis, A.H., Ransford, B., Scopelliti, K., Frazier, E.A., Liu, R.T., 2019. Emotion dysregulation and non-suicidal self-injury: A systematic review and meta-analysis. Eur. Psychiatry 59, 25–36. https://doi.org/10.1016/j.eurpsy.2019.03.004.

Xiao, Q., Song, X., Huang, L., Hou, D., Huang, X., 2022. Global prevalence and characteristics of non-suicidal self-injury between 2010 and 2021 among a non-clinical sample of adolescents: A meta-analysis. Front. Psychol. 13, 912441. https://doi.org/10.3389/fpsyt.2022.912441.

Zullo, L., Rogers, M.L., Taliaferro, L.A., 2024. NSSI among sexual and gender diverse youth. In: Lloyd-Richardson, E.E., Baetens, I., Whitlock, J.L. (Eds.), The Oxford Handbook of Nonsuicidal Self-Injury. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780197611272.013.33.